CLAIMS

1. A method of making a xyloglucan conjugate comprising the steps of:

   (a) preparing xyloglucan fragments from xyloglucan polymers; and

   (b) attaching one or more functional groups to the reducing end and/or side chains of the xyloglucan fragments whereby a xyloglucan conjugate useful for binding to cellulosic material is produced.

2. The method of claim 1 wherein said xyloglucan fragments are prepared by enzymatic digestion.

3. The method of claim 2 wherein said enzymatic digestion is carried out by employing β-1,4-*endo*glucanase.

4. The method of claim 1 wherein said xyloglucan fragments are a mixture of oligosaccharides ranging in size up to five hundred glycosyl residues.

5. The method of claim 4 wherein said xyloglucan fragments are a mixture of oligosaccharides ranging in size up to three hundred glycosyl residues.

6. The method of claim 1 wherein said xyloglucan conjugate comprises more than one type of functional group per xyloglucan fragment.

7. The method of claim 1 wherein said xyloglucan fragments consist of up to 60 randomly ordered hepta-, octa-, and nonasaccharide subunits, each of which has a β-1,4-tetraglucoside backbone.

8. The method of claim 1 wherein said functional group is a dye molecule.

9. The method of claim 8 wherein said dye molecule is an azo dye.

10. The method of claim 1 wherein said functional group is selected from the group of compounds useful as a fabric softener, antimicrobial agent, water repellant, oil repellant or a firming agent.

11. The method of claim 1 wherein said functional group is an aromatic amine.

12. The method of claim 11 wherein said functional group is attached in a 2-step process comprising (i) attaching an aromatic amine and (ii) performing an azo coupling on the resulting carbohydrate conjugate.

13. The method of claim 12 wherein said aromatic amine is attached by reductive amination.

14. The method of claim 12 wherein said aromatic amine is attached by electrolytic oxidation followed by amide bond formation.

15. The method of claim 12 wherein said aromatic amine is attached by carbon-carbon bond formation between xyloglucan fragments and a heterocyclic compound.

16. The method of claim 15 wherein said heterocyclic compound is a pyrazolinone derivative.

17. A xyloglucan conjugate capable of binding to cellulosic material.

18. The xyloglucan conjugate of claim 17 comprising a dye molecule.

19. The xyloglucan conjugate of claim 18 wherein said dye is an azo dye.

20. The xyloglucan conjugate of claim 17 comprising a functional group useful as a fabric softener, fluorescent brightening agent, lubricant, antimicrobial agent, water repellent, oil repellent, or a firming agent.

21. The xyloglucan conjugate of claim 17 wherein the cellulosic material is cotton.

22. A method of attaching a functional group to cellulosic material comprising the steps of:

(a) preparing xyloglucan fragments from xyloglucan polymers by hydrolysis;

(b) attaching one or more functional groups to the reducing end and/or side chains of the xyloglucan fragments to produce a xyloglucan conjugate; and

(c) treating a cellulosic material with the xyloglucan conjugate whereby the cellulosic material containing the functional group is produced.

23. The method of claim 22 wherein said functional group is a dye molecule.

24. The method of claim 22 wherein the xyloglucan conjugate comprises more than one type of functional group per xyloglucan fragment.

25. The method of claim 22 wherein said functional group is selected from the group of compounds useful as a lubricant, fluorescent brightening agent, fabric softener, antimicrobial agent, water repellant, oil repellant or a firming agent.

26. The molecule of claim 23 wherein said dye molecule is an azo dye.

27. The method of claim 22 wherein said cellulosic material is cotton.

28. The method of claim 22 wherein said hydrolysis step is carried out by using an enzyme selected from the group consisting of β-galactosidase, β-1,4-*endo*glucanase, and xyloglucan *endo*transglycosidase (XET).

29. The method of claim 28 wherein said enzyme is β-1,4-*endo*glucanase.

30. The method of claim 22 wherein said xyloglucan fragments consist of up to 60 randomly ordered hepta-, octa-, and nonasaccharide subunits, each of which has a β-1,4-tetraglucoside backbone.

31. The method of claim 22 wherein said xyloglucan conjugates are treated with beta-galactosidase.

32. The method of claim 22 wherein said xyloglucan fragments are purified by ultrafiltration.

33. The method of claim 22 wherein said xyloglucan conjugates are purified by ultrafiltration.

34. A method of attaching a functional group to cellulosic material comprising the steps of:

(a) attaching one or more functional groups to the side chains of xyloglucan polymers to form modified xyloglucan polymers;

(b) preparing a xyloglucan conjugate from the modified xyloglucan polymers of (a) by hydolysis; and

(c) treating a cellulosic material with the xyloglucan conjugate whereby the cellulosic material containing the functional group is produced.

35. The method of claim 34 wherein said functional group is a dye molecule.

36. The method of claim 34 wherein the xyloglucan conjugate comprises more than one type of functional group per xyloglucan fragment.

37. The method of claim 34 wherein said functional group is selected from the group of compounds useful as a lubricant, fluorescent brightening agent, fabric softener, antimicrobial agent, water repellant, oil repellant or a firming agent.

38. The method of claim 35 wherein said dye molecule is an azo dye.

39. The method of claim 34 wherein said cellulosic material is cotton.

40. The method of claim 34 wherein said hydrolysis step is carried out by enzymatic digestion.

41. The method of claim 40 wherein said enzymatic digestion is carried out by employing *endo*glucanase.

42. The method of claim 34 wherein said xyloglucan conjugate is purified by ultrafiltration.